WHAT IS CLAIMED IS:

1. A cell-containing implant for implantation into a patient comprising:

a polymeric matrix shaped in the form of the desired implant; and

a mixture of dissociated cells comprising smooth muscle cells and cells of at least one other cell type deposited on and in the matrix.

2. The cell-containing implant of claim 1, wherein the cells of at least one other cell type are chondrocytes or osteoblasts, and further wherein the implant provides structural support with a structural strength that exceeds that of natural cartilage.

3. The cell-containing implant of claim 1, further comprising an angiogenic compound.

4. The cell-containing implant of claim 1, wherein the polymeric matrix comprises polymers coated with agar, agarose, gelatin, gum arabic, or a mixture of two or more of these substances.

5. An implantable structural member for use in treating a patient having an anatomical defect that requires structural support, the structural member comprising

(a) a polymeric matrix shaped in the form of the desired support member; and

(b) a mixture of cells containing at least dissociated cartilage-forming cells and non-cartilage cells, wherein the non-cartilage cells comprise smooth muscle cells deposited on and in the matrix,

such that when the matrix is implanted, a structural support member is formed.

6. The implantable structural member of claim 5, wherein the matrix is in the form of a sheet, a column, a fluted column, a polygon, or a sphere.

7. The implantable structural member of claim 5, wherein the matrix comprises polyglycolide, polylactide, collagen, alginate, or a mixture thereof.

8. The implantable structural member of claim 5, further comprising an angiogenic compound.

9. The implantable structural member of claim 5, wherein the polymeric matrix comprises polymers coated with agar, agarose, gelatin, gum arabic, or a mixture of two or more of these substances.

10. A tissue engineering method comprising

seeding a polymer matrix with a mixture containing smooth muscle cells and cells of at least one other type; and

culturing the mixture of cell types under conditions suitable for cell growth or maintenance,

whereby a hybrid tissue is formed comprising a mixed cell population containing at least the smooth muscle cells and the cells of at least one other type .

11. The tissue engineering method of claim 10, wherein expanded populations of the smooth muscle cells and the cells of at least one other type are produced by culturing after both types of cells are seeded onto the matrix.

12. The tissue engineering method of claim 10, wherein expanded populations of the smooth muscle cells and the cells of at least one other type are produced before seeding unto the matrix.

13. The tissue engineering method of claim 10, wherein the cells of the at least one different cell type are chondrocytes or osteoblasts, and further wherein the hybrid tissue provides structural support with a structural strength that exceeds that of natural cartilage.

14. The tissue engineering method of claim 10, wherein the matrix is in the form of a sheet, a column, a fluted column, a polygon, or a sphere.

15. The tissue engineering method of claim 10, wherein the matrix comprises polyglycolide, polylactide, collagen, alginate, or a mixture thereof.

16. A method for treating a patient having an anatomical defect of a type that can be treated, at least in part, by providing structural support to adjacent tissue, said method comprising the steps of:

providing a polymeric matrix shaped in the form of a desired support member, the polymer matrix having deposited thereon a mixture of dissociated cells comprising smooth muscle cells and cells of at least one other cell type to produce a matrix/cell construct; and

implanting the matrix/cell construct in the patient at a site that needs structural support so that the construct forms a structural member with controlled biomechanical properties to provide the required structural support in the defect area.

17. The method of claim 16, wherein the cells of the at least one other cell type include cartilage-forming cells and the construct forms a cartilaginous structure member.

18. The method of claim 16, wherein the shape of the polymer matrix is determined by CAT scan or MRI imaging of a patient before surgery.

19. The method of claim 16, wherein the polymer matrix is manufactured in a solid block and altered in shape before or after seeding with a mixture of cells.

20. The method of claim 19, wherein the shape of the polymer matrix is fabricated by hand or by computer aided design-computer aided manufacturing (CAD-CAM) systems.